



Method of Forming a Microstructure by Using Maskless Lithography

[View U.S. Patent No. 7,165,566 in PDF format.](#)

WARF: P02099US

Inventors: David Beebe

The Wisconsin Alumni Research Foundation (WARF) is seeking commercial partners interested in developing a method for fabricating microfluidic channels and systems, which uses maskless lithography.

Overview

Maskless lithography is cheaper and simpler than current methods of fabricating microfluidic channels, such as micro-molding, that require a final bonding step to attach a top cover to enclose the channel on all sides.

The Invention

A UW-Madison researcher has developed a method of using maskless lithography to fabricate microfluidic channels and systems. To create a microfluidic device, a first layer is laid down in relation to a base layer so as to create a construction cavity between them. The construction cavity is filled with a polymerizable material and a desired mask pattern is drawn on a computer. Using the mask as a guide, the computer uses mirrors to direct a polymerizing agent, such as UV light, toward the regions of the device that will be polymerized.

Parts of the device not subjected to the polymerizing agent (including the inside of the channels) are not polymerized. Flushing the non-polymerized material from the construction cavity leaves the desired channel network.

Additional layers may be placed on top of the first layer to create additional construction cavities between them. The additional construction cavities are filled with material, a portion of which is polymerized to define additional channels in the microstructure.

Applications

- Flexible custom microfluidic device manufacturing and prototyping

Key Benefits

- Simpler and faster than current methods
- Inexpensive
- Provides improved flexibility for multi-step exposures
- Could lead to an ultra-rapid manufacturing system that could produce microfluidic devices quickly and efficiently

Additional Information

For More Information About the Inventors

- [David Beebe](#)

Tech Fields

- [Analytical Instrumentation, Methods & Materials : Microfluidics](#)
- [Semiconductors & Integrated Circuits : Lithography](#)

For current licensing status, please contact Jeanine Burmania at jeanine@warf.org or 608-960-9846